Space Weather Forecast

Issued on Thursday, 01 August 2024 at 01:15 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

---

Space Weather Forecast Headline: Moderate flares expected, chance of Strong flares. Potential further Coronal Mass Ejection glancing blows Days 1-2 (01-02 Aug), risk of G1/Minor to G2/Moderate Storms. Chance of exceeding S1/Minor Radiation Storm threshold.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity is Moderate to High, with seven Moderate-class flares observed from across the disc in the last 24 hours. We have a highly active disc with thirteen sunspot regions. A region near the southwest limb continues to display magnetic complexity although this region is becoming increasingly difficult to assess near the limb. Several regions in the southwest disc are in a cluster close together, with two in particular in very close proximity, to the point where the two regions are pushed together with the trailing and leading portions sharing a penumbra. A further region west of centre disc persists with marked magnetic complexity. A region in the southeast is now also revealing magnetic complexity. Three further regions near the east limb are difficult to assess with the current viewing angle.

Currently none of the Coronal Mass Ejections (CMEs) seen in imagery in the last 24 hours are thought to be Earth directed. A CME is likely to have been produced from a recent Moderate-class flare peaking at 31/1837 UTC, but we await imagery to assess this. Given the region's location, it would need to be a particularly wide CME to affect Earth.

Solar Wind / Geomagnetic Activity: The solar wind has seen two further CME arrivals, one at 31/1040 UTC and the other at 31/1347 UTC. Wind speeds were mostly at slightly elevated levels, but with a slight uptick after each CME arrival, currently near 450 km/s. The Interplanetary Magnetic Field was weak at first, increasing to moderate after the first CME arrival, then briefly becoming strong after the second arrival. The north-south component was weakly positive until the second CME arrival, after which it started to vary moderately. Geomagnetic activity was Quiet to Active (Kp1-4), with a G1/Minor Storm (Kp5) interval 31/1800-2100 UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate to High activity forecast to continue, with occasional Moderate class flares expected and a chance of isolated Strong flares.

Solar Wind /Geomagnetic Activity: Current CME influence is ongoing, but with limited impact so far. Further CME arrivals are then possible on Days 1-2 (01-02 Aug), chiefly on Day 1. They are both low confidence, but glancing blows are possible on both days. Furthermore, due to the number of coincident CMEs, further arrivals cannot be ruled out through the period.

No coronal hole fast wind enhancements are expected, with CME arrivals expected to be the main factor of interest during this period. Geomagnetic activity is expected to be often Unsettled to G1/Minor Storm, with a chance of G2/Moderate Storms and a slight chance of G3/Strong Storm intervals, should any CME arrivals bring more than a glancing blow. In the absence of further CME influence, activity is likely to become mostly Quiet to Unsettled later in the period.

Energetic Particles / Solar Radiation: Solar radiation is currently at background levels, but with a chance of exceeding the S1/Minor Solar Radiation Storm level in response to larger flares from the western disc.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2024. All Rights Reserved.

Met Office Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	60	20	5	5
Strong	G3	No	5	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	90	90	90	80
Very Active	R3 to R5 X	No	25	25	25	20

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	25	25	25	25
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2024. All Rights Reserved.